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EXAMINER

JACKSON, BLANE J

ART UNIT PAPER NUMBER

2685

DATE MAILED: 10/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/686,090

Applicant(s)

ODA, TOSHIYUKI

Examiner

Blane J Jackson

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-2 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title or similar is suggested: CDMA Receiver and CDMA Demodulator with AGC Circuit.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rainish et al. (U.S. Patent 6,606,490) with a view to Hideo (JP-A 10-200353).

As to claim 1, Rainish teaches an AGC circuit in a CDMA receiver comprising an AGC loop for calculating received signal power level from a received signal and controlling the received signal power level to be constant (figure 3, column 3, lines 4-14). Rainish does not include means for controlling the control timing based on control amount (figure 5, Rainish determines whether or not to utilize AGC based on threshold comparisons of the signal power measurement). ✓

*During a power comparison
interval.
Col 3 lines 24-41*

Hideo teaches a AGC control method for a receiver where the AGC operation mode, the AGC signal, is established at a point of time a little before the arrival of the next burst receiving timing by estimation of the startup time in relation to the following slot and changing the gain control initiation timing to be earlier than the following slot head (Abstract, figure 7 and paragraph 0049, as represented in a copy of a Japanese Office Action dated March 19, 2003 from the applicant's IDS).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the AGC system of Rainish with the AGC circuit under timing control of Hideo to ensure an operating and satisfactory AGC control from the first part of the burst (the beginning of the slot with data information) signal.

As to claim 5, with reference to claims 3 or 4, Rainish does not teach where the AGC includes a control unit for calculating control time according to the result of calculation in the power level calculating unit, calculating and controlling the control timing based on the control amount and feeding out the control voltage.

Hideo teaches a controller (figure 1, (10)) that outputs a reception discrimination signal for designating the AGC operation mode at a point of time a little before the arrival of the next burst receiving timing (timing to estimate the startup time to prepare the AGC level in relation to the following data slot) where the determined control amount is based on the reception signal intensity detected by the level detector (5) (figure 7 and Abstract and paragraph 0049). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the AGC system of Rainish with the timing

control of Hideo to present a stable or satisfactory AGC level at the start of the following data slot.

As to claim 7, Rainish teaches a CDMA demodulator for receiving and demodulating a spread spectrum signal (figures 1 & 3, column 2, lines 1-41) comprising:

An intermediate frequency signal converter for receiving the spread spectrum signal and converting the same signal to an intermediate frequency signal (downconverter (102)),

An AGC amplifier for variable gain amplifying the intermediate frequency signal with a control voltage (AGC 1 (103) and AGC 2 (106) distributed with a bandpass filter included),

A demodulating unit for demodulating the output signal of the AGC amplifier to a base-band signal (quadrature type, mixers (108), (109),

A first low pass filter for limiting the band of the base-band signal to a band corresponding to one channel and feeding out a first low-pass filter output signal (LPFs (110), (111),

An A/D converter for quantizing the level of full power in the band of the first low-pass filter output signal and feeding out the quantized signal (A/D converters (112), (113),

A power level calculating unit for averaging the power level of the quantized signal for a predetermined period of time from an instant corresponding to the forefront of slot and feeding out an average power level signal representing the average power

Art Unit: 2685

level (Rx power estimator (124), reference claim 3 for discussion as to forefront of a slot),

Rainish does not teach a control unit for calculating control time based on the average power level represented by the average power level signal and feeding out control data upon reaching of a predetermined instant of time. Rainish exhibits a circuit that necessarily includes but is silent as to an A/D converter for converting the control data to an analog control signal and a second low-pass filter for waveform shaping the along control signal and feeding the control voltage to the AGC amplifier.

Hideo teaches a digital wireless receiver with an AGC loop (figure 1, (4)) that includes a D/A converter (8) for converting control data followed by a low pass filter (9) to feed the control voltage to the AGC amplifier (3). It would have been obvious to one of ordinary skill in the art at the time of the invention to realize in Rainish the loop components shown by Hideo to complete a functioning AGC control loop between the control amount determination and variable RF amplifier.

Hideo further teaches a control unit (10) for calculating control time based on the average power level represented by the average power level signal and feeding out control data upon reaching of a predetermined instant of time (Abstract and per admission in applicant's IDS reference of a Japanese Office Action dated March 19, 2003). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the AGC system of Rainish with the timing control of Hideo to present a stable or satisfactory AGC level at the start of the following data slot.

As to claim 8, Rainish teaches an AGC circuit in a CDMA receiver comprising an AGC loop for computing a received signal power level from a received signal and controlling the received signal power level to be constant (figure 3, column lines 1-41) but does not teach a control timing controlling method adopted in an AGC circuit. Hideo teaches a control timing controlling method adopted in an AGC circuit in a digital wireless receiver by taking the rise time of the next slot (when it begins), the instant of start of control is variably set to be earlier than the forefront of the next slot so as to obtain coincidence of the instant of reaching of a desired voltage with the forefront of the next slot (Abstract, figures 1 and 7 and per admission in applicant's IDS reference of a Japanese Office Action dated March 19, 2003). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the AGC system of Rainish with the timing control of Hideo to present a stable or satisfactory AGC level at the start of the following data slot.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 2, 3 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Rainish (U.S. Patent 6,606,490).

As to claims 2 and 3, Rainish teaches a CDMA demodulator for receiving and demodulating a spread spectrum signal (figure 3) comprising an AGC loop including an intermediate frequency signal converter (downconverter (102)) for converting the spread spectrum signal to an intermediate frequency signal and an AGC amplifier ((103) & (105)) for variable gain amplifying the intermediate frequency signal with a control voltage (column 2, lines 1-20) and the AGC loop includes a power level calculating unit for calculating the level of full power in the band of a channel under reception (Rx power estimator (124), column 2, lines 11-20). Rainish also teaches the power level calculating unit starting the power level calculation from an instant corresponding to the forefront of a slot (figure 2-prior art, period T_{AGC} shows AGC operation in the forefront of a slot prior to the assigned data slot).

*Fig 4 TAGC
col 3 lines 14-23
power comparison method*

As to claim 6, with respect to claim 2, Rainish teaches the power level calculating unit starts the power level calculation from an intermediate part of the slot (figure 5, where the system selects full AGC operation after a short received signal power measurement at the forefront of the "pre-conditioned interval" or slot prior to sleep and start of the next slot, column 3, lines 25-35).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rainish et al. (U.S. Patent 6,606,490) with a view to Morijama et al. (U.S. 6,314,144).

As to claim 4, Rainish teaches the claim elements discussed in claims 3 and 4 but does not teach making the length of the subject of calculation to be variable.

Moriyama teaches a digital receiver with an AGC control period in the preamble or non-communication section in the TDMA method where the control unit can further divide a selected slot of the receiving frame, an AGC control period for measuring only the desired signal and a period for measuring both the desired and interfering (adjacent channel) signal (figures 6, 9a, 9b, column 7, lines 1-12 and 40-49). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the AGC control of Rainish with the method of Moriyama so that AGC is performed in proportion to the ratio of both of the input signals.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dowling (U.S. Patent 6,434,186) teaches a CDMA receiver with settling time for the AGC. Zhang (U.S. Patent 6,038,435) teaches a digital receiver with variable step size AGC. Wilson et al. (U.S. Patent 5,617,060) teaches AGC for controlling signal power of a digital receiver RF signal over a wide dynamic range. Kimura (U.S. Patent 5,974,040) discloses a TDMA receiver with an AGC circuit controlling a variable attenuator to avoid saturation


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J Jackson whose telephone number is (703) 305-

5291. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

BJJ


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